26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

AMERICAN JOURNAL
OF
PHYSICAL ANTHROPOLOGY

EDITOR
ALEŠ HRDLIČKA

ASSOCIATE EDITORS

DR. ROBERT BENNETT BEAN
University of Virginia

PROFESSOR DAVIDSON BLACK
Peking Union Medical College

PROFESSOR FRANZ BOAS
Columbia University

DR. CHARLES HASKELL DANFORTH
Leland Stanford University

DR. CHARLES B. DAVENPORT
Carnegie Institution of Washington

PROFESSOR H. H. DONALDSON
The Wistar Institute

PROFESSOR E. A. HOOTON
Peabody Museum, Harvard University

PROFESSOR GEORGE GRANT MACCURDY
Yale University

PROFESSOR J. HOWARD MCGREGOR
Columbia University

DR. DUDLEY J. MORTON
Columbia University

DR. RICHARD E. SCAMMON
The University of Chicago

DR. ADOLPH H. SCHULTZ
Johns Hopkins Medical School, Baltimore

PROFESSOR R. J. TERRY
Washington University, St. Louis

PROFESSOR T. WINGATE TODD
Western Reserve University

DR. CLARK WISSLER
American Museum of Natural History

VOLUME XVII
JULY—SEPTEMBER, OCTOBER—DECEMBER, 1932
JANUARY—MARCH, APRIL—JUNE, 1933

THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
PHILADELPHIA, PA.

[title page]

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

DERMATOGLYPHICS IN COMANCHE INDIANS[1]

HAROLD CUMMINS[2] AND MARCUS S. GOLDSTEIN

This note reports an analysis of the palmar dermatoglyphics and finger prints in seventy-nine North American Indians (Comanches, in Oklahoma). Beginning with Wilder's pioneer contribution, 1904, there has been sufficient investigation of racial variation in dermatoglyphics to demonstrate the existence of distinctive racial trends in these features. There is not yet available, however, an adequate body of comparative data for broad discussion of racial resemblances and differences. The present report is accordingly treated simply as a record of findings in the Comanche sample, to provide the detailed data necessary for future racial comparisons. In view of this purpose, neither a review of the field nor a full bibliography is considered essential.[3] It may be pointed out that little work has been done with the dermatoglyphics of North American Indians. Downey (Types of dextrality among North American Indians, Jour. Exp. Psychol., vol. 10, 1927) records finger-print data for fifty Arapahoes. Cummins presented before the American Association of Physical Anthropologists, in March, 1932, an account of findings (palmar and plantar features) in twenty-seven Shoshonis and Arapahoes.

128 121 121 128 121

[1] Grateful acknowledgment is extended to the American Association for the Advancement of Science for a grant-in-aid which made it possible to secure the data here reported. We are further indebted to the authorities of the Indian School at Lawton, Oklahoma, for their invaluable cooperation in providing access to subjects.

122

[2] Department of Anatomy, Tulane University.

[3] For bibliography see especially: Bonnevie, K., J. Genet., XV, 1924; Bonnevie, K., Z. indukt. Abst- & Vererbungsl., LIX, 1931; Cummins, H., Am. J. Phys. Anthrop., XV, 1930; Midlo, C., and H. Cummins, ibid., XVI, 1931.

114 113

[p. 229]

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

125 Of the 79 Comanches here reported 27 are males and 52 [144] are females. Thirty-four are full-blood or probably full-blood, 41 are mixed (especially with 'Mexican') or probably mixed, and 4 are questionable. The prints were obtained by Goldstein in the course of other work on the physical anthropology of the Comanches, and the foregoing statement of the racial composition of the sample is based upon individual diagnoses employing the usual criteria (Hrdlička's skin reaction, pigmentation, character of hair, eye color, facial features, inquiry respecting geneaology, etc.). While there was no specific investigation into possible family relationships among the individuals in the series, the circumstances of collection indicate that close relationships are negligible in number if present at all.

128 The prints, prepared by the common printers' ink method, 125 are generally of excellent technical quality, and in many cases there are duplicate impressions. In certain determinations the full series of seventy-nine subjects cannot be utilized. Two subjects are each represented by prints of but one hand, and occasionally a print may be incomplete or indecipherable 128 in a critical territory. Such instances are appropriately set aside in the calculations, and it is to be emphasized that all omissions of prints in the several calculations are due solely to this correction, every available observation having been included.

The methods of interpretation and formulation of the apical finger patterns follow Galton (1892); the palmar features are formulated after Cummins et al. ('29).

Palmar main lines

142 The terminations of palmar main lines are summarized in table 1. Line A shows a high frequency of terminations in the proximal palmar margin (positions 1 and 2) and in the more proximal portion of the ulnar margin (position 3). Line C presents an exceptional abundance of suppressed and abortive states (formulated X, x, and O in accordance with the specific character of the line), which occur in 25.5 per cent

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

142

of the hands. Line D is very rarely subject to such suppression or reduction, but in this series there are two hands so distinguished. The terminations of line D, grouped in the modal types of Cummins and Midlo ('26), are as follows: type 7, 28.1 per cent; type 9, 48.7 per cent; type 11, 23.2 per cent. The main-line formulae may be grouped in accordance with the suggestion of Wilder ('22), who points out that in any racial collection the majority of the formulae (omitting

TABLE 1

Terminations of the palmar main lines, stated in terms of the percentile occurrence of each position. Compiled from 77 right palms and 79 lefts. R, right; L, left

POSITION	LINE A			LINE B			LINE C			LINE D		
	R	L	Average	R	L	Average	R	L	Average	R	L	Average
1	1.3	30.4	15.8									
2	1.3	8.9	5.1									
3	42.9	38.0	40.4		2.5	1.2						
4	16.9	10.1	13.5		1.3	0.6						
5′	37.7	12.7	25.2	3.9	19.0	11.4						
5″				58.4	39.5	58.9	10.4	29.1	19.7			
6				6.5	2.5	4.5	10.4	3.8	7.1			
7				29.9	15.2	22.5	26.0	22.8	24.4	11.7	27.8	19.7
8				1.3		0.6				10.4	3.8	7.1
9							35.1	10.1	22.6	40.3	48.1	44.2
10							1.3		0.6	6.5	2.5	4.5
11										31.2	15.2	23.2
X							2.6	11.4	7.0		1.3	0.6
x							2.6	5.1	3.8			
O							11.7	17.7	14.7		1.3	0.6

line A) are of three characteristic forms. In this series the frequencies are: 7.5.5.–, 17.2 per cent; 9.7.5.–, 37.7 per cent; 11.9.7.–, 21.9 per cent; all others, 23.1 per cent.

Axial triradii

All the prints in the collection, namely, 77 right palms and 79 lefts, admit positive determinations of axial triradii. The occurrences are: 0, 1.3 per cent; t, 65.4 per cent; t′, 29.5 per cent; t″, 1.3 per cent; tt′, 1.9 per cent; tt″, 0.6 per cent. There is no significant bimanual distinction in the frequencies of the several types.

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

Palmar patterns

142 The occurrence of patterns in the five palmar areas are
128 listed in table 2. It will be understood that in each case the determination aims only to distinguish the occurrence of patterns and patternless configurations. Each figure in the table applies to the frequency of patterns, while the implied percentile remainder indicates the frequency of patternless configurations.

142 Especially outstanding, in the figures of table 2, are the low frequency of hypothenar patterns and the abundance of the thenar/first interdigital.

TABLE 2

Percentile occurrences of true patterns and pattern vestiges (not including 'multiplications') of the five palmar areas. Compiled from 77 right palms and 79 lefts

PATTERN	RIGHT, PER CENT	LEFT, PER CENT	AVERAGE, PER CENT
Hypothenar	15.6	19.0	17.3
Thenar/First interdigital	28.6	41.8	35.2
Second interdigital	2.6	2.5	2.5
Third interdigital	41.6	19.0	30.3
Fourth interdigital	54.5	73.4	63.9

Apical finger patterns

[128] Calculation of the total frequencies of the pattern types is based upon sixty-seven individuals, the remainder of the finger-print sets being incomplete and thus unsuited to the determination. In these 670 prints the distribution of pattern types is as follows: whorls, 43.3 per cent; radial loops, 1.9
142 per cent; ulnar loops, 48.5 per cent; arches, 6.3 per cent. The
144 corresponding figures in Downey's series of fifty Arapahoes (loc. cit.) are: whorls, 47.6 per cent; radial loops, 3.6 per cent; ulnar loops, 44.2 per cent; arches, 4.6 per cent. It would appear that the abundance of whorls is a substantial Indian trait.

128 In view of the high frequency of whorls, it may be of interest to state the composition of the material in terms of

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

a newly devised 'index of pattern intensity' (Cummins and M. Steggerda, unpublished manuscript). The index of pattern intensity is an expression which reduces the pattern composition of the individual finger-print set to an integral value. It is based on the assumption that arches, loops, and whorls represent successively increasing weights of pattern intensity. These configurations are assigned, respectively, the values of 0, 1, and 2. The index of pattern intensity of the individual is simply the sum of the ten digital values. The indices thus range from 0 to 20.

The mean index of pattern intensity in this Comanche series is 13.7 ± .31. While the available collections computed

TABLE 3

Percentile occurrences of pattern types for each digit. R, right; L, left

DIGITS	I		II		III		IV		V	
Hands	R	L	R	L	R	L	R	L	R	L
Number of digits compiled	71	73	75	75	76	79	76	77	75	76
Arches	2.8	1.4	16.0	14.7	5.3	7.6	1.3	2.6	4.0	2.6
Radial loops	1.4	1.4	8.0	5.3				2.6		
Ulnar loops	33.8	37.0	36.0	36.0	68.4	63.3	26.3	29.9	80.0	80.3
Whorls	62.0	60.0	40.0	44.0	26.3	29.1	72.4	64.9	16.0	17.1

on this basis (Cummins and M. Steggerda, MS.) are likewise small and consequently associated with a large probable error, the following indices are noted for comparison: Eskimos, 14.25 ± .35; Jews, 13.84 ± .18; European-Americans, 12.70 ± .24; Dutch (a selected family series), 11.09 ± .23.

The distribution of the indices in the Comanche series may be compactly stated by dividing the 21 indices into 7 classes, identifying each class by its center as follows: 1, 0 per cent; 4, 1.5 per cent; 7, 9 per cent; 10, 15 per cent; 13, 31.3 per cent; 16, 22.4 per cent; 19, 20.9 per cent.

The distributions of pattern types, separately for each digit, are shown in table 3. While the series is too small to justify a positive conclusion, there is a suggestion of a

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

142 tendency toward suppression of the characteristic dextral superiority in the occurrence of whorls. In this connection it may be remarked that there is yet another indication of suppression of a characteristic bimanual difference, expressed [144] in the palmar hypothenar pattern. And it should not be forgotten that corresponding bimanual comparisons, involving both apical and hypothenar patterns have been previously reported in Indians of southern Mexico and Central America (Cummins, '30).

POSSIBLE INFLUENCE OF RACIAL ADMIXTURE

128 Inasmuch as individual diagnoses of racial admixture are available, it is possible to isolate the series of full-bloods for separate analysis. This separation is suggested not only by the obvious desirability of treating a full-blood stock when it can be secured, but also by the known results of admixture in Jamaican black-white crosses (L. D. Steggerda). In the Jamaican crosses the "Brown individuals approximate the Blacks more nearly than they do the Whites" in dermato-
142 glyphic features. It is evident that traits of the Comanches
144 are not generally obscured by the inclusion in the sample of a large proportion of mixed stock, and it may be assumed
128 accordingly that either the sources of admixture are closely allied in their dermatoglyphics or that the Comanche traits dominate the admixture. The separate calculations of palmar main lines, palmar patterns, and apical finger patterns reveal but one item in which the incidences are significantly different in the selected full-bloods. This feature is the hypothenar pattern, which occurs in only 4 per cent of the full-blood hands. With this exception, therefore, it is evident that the inclusion of mixed-bloods has not vitiated the series as a sample of Comanche dermatoglyphics.

26: Cummins & Goldstein D-5 (no date) 1932 NO6 Comanche NO6
Oklahoma

SUMMARY

This series, comprising seventy-nine Comanche Indians, presents the following noteworthy features in the palmar dermatoglyphics:

Line A is characterized by the abundance of very low terminations. Line C is frequently abortive or absent. Line D does not commonly extend far radialward. Hypothenar patterns are infrequent, while thenar/first interdigital patterns are abundant. Apical finger patterns present a high frequency of whorls.

Though the report is presented as a mere record of findings, without comparison with other races, it may be noted that there are suggestive likenesses to the Eskimos and to the Indians of southern Mexico and Central America.